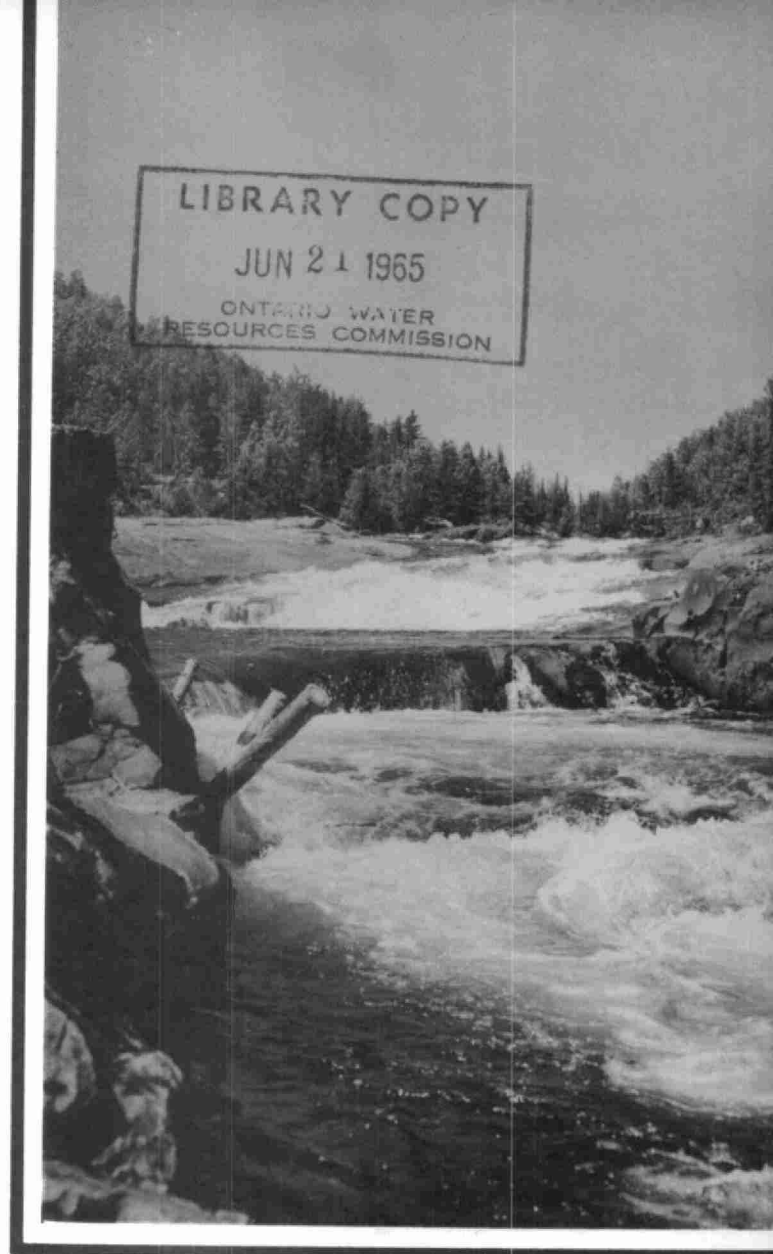


*Port Colborne
Sewage
Treatment
Plants*



1963 Annual Report

Ontario Water Resources Commission

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ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

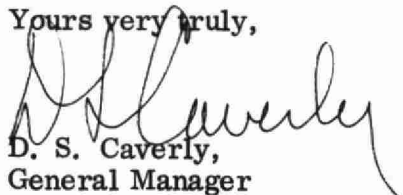
Mayor and Members of Council,
Town of Port Colborne.

Gentlemen:

I am pleased to submit, for your information, the 1963 Annual Operating Report of the Port Colborne Sewage Treatment Plant, OWRC Project No. 59-S-47, which has been prepared by our Division of Plant Operations.

We are grateful for the kind cooperation which you and your staff have extended to our Operations staff throughout the year. We look forward to a continuing close association with you in our mutual endeavour to control pollution.

Yours very truly,


D. S. Caverly,
General Manager



General Manager,
Ontario Water Resources Commission.

Dear Sir:

It is with pleasure that I present to you the Annual Report of the operation of the Port Colborne Sewage Treatment Plant, OWRC Project No. 59-S-47 for 1963.

This report presents design data, outlines operating problems encountered and summarizes in tables, charts and graphs all significant flow and cost data.

Yours very truly,

B. C. Palmer,
Director,
Division of Plant Operations.

foreword



This report is designed to present the highlights of the operation of these works during 1963. Trends in flows and other operating data can be extremely useful in the development of necessary long range enlargement and improvement programs.

In addition to the activities reported herein, much unrecorded effort has contributed to the success of this operation. The municipality, through representatives on the Local Advisory Committee, has given valuable assistance in reviewing salary schedules, detailed operating budgets, personnel problems, flow patterns, and major maintenance problems.

The Division of Plant Operations has provided direction to the field staff in administrative procedures, quality control, maintenance schedules, equipment inspection and purchase supervision. A number of other Divisions of the Commission have been of service. The Division of Construction has offered helpful advice on equipment selection and renovation problems. The Division of Sanitary Engineering has maintained, through its District Engineering staff, a keen interest in the operation and has made a number of constructive recommendations. Its operator training courses have been very helpful. The Division of Finance has processed many payrolls, purchase orders and invoices dealing directly with this project. The Commission Personnel Director has been most helpful in counselling of personnel problems.

The excellent cooperation of all of these groups is gratefully acknowledged.

B. C. Palmer,
Director,
Division of Plant Operations



DIVISION OF PLANT OPERATIONS

contents

Foreword.....	Page 1
View of Plant.....	Page 2
History.....	Page 3
Project Staff.....	Page 4
Description of Project.....	Page 5
Design Data.....	Page 10
Plant Flow Chart.....	Page 16
Process Data.....	Page 17
Operating Costs.....	Page 35
Summary.....	Page 37
Total Costs.....	Inside back cover

C. W. Perry
Assistant Director
A. C. Beattie
Regional Supervisor
P. J. Osmond
Operations Engineer

PORT COLBORNE SEWAGE TREATMENT PLANTS

OPERATED FOR
THE TOWN OF PORT COLBORNE

BY
THE ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN

A. M. Snider

COMMISSIONERS

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J. H. H. Root, M.P.P.

J. A. Vance, LL. D.

A. A. Wishart, Q. C., M.P.P.

GENERAL MANAGER

D. S. Caverly

ASSISTANT GENERAL MANAGERS

G. M. Galimbert

L. E. Owers

COMMISSION SECRETARY

W. S. MacDonnell

1959_{to} 1963 History

HISTORY

In 1959, the Town of Port Colborne and the Ontario Water Resources Commission initiated plans for the construction of the West Side Sewage Treatment Plant. This new activated sludge plant was placed in operation in November 1961, and officially opened on July 25th, 1962.

During 1961, meetings were held between the town and the Commission to discuss operation of the existing sewage system which comprised the Killaly Street and King Street plants and seven pumping stations. On June 1st, 1961, at the request of the town, the Division of Plant Operations of the Ontario Water Resources Commission took over operation of the above mentioned works. Four members of the town staff were transferred to the OWRC staff at this time.

At the end of 1962, the Clarke Street pumping station was placed in service. This station is part of Project No. 60-S-73 which also includes a force main to Killaly Street plant and sanitary sewers.

The summer of 1963 saw the incorporation of the Fretz Park pumping station, Project No. 62-S-108, into the system. This new station serves the southeast portion of the town and replaces the old Colborne Street station.

Project Staff

Mr. J. Telfer - Chief Operator

Operators

M. Baggio
J. Bilodeau
C. Root
J. Sieber
S. Toth
E. Young

Mechanic

J. Blanchard

COMMENTS

There were no additions or deletions to the staff during 1963 which saw the consolidation of the project into a polished operation.

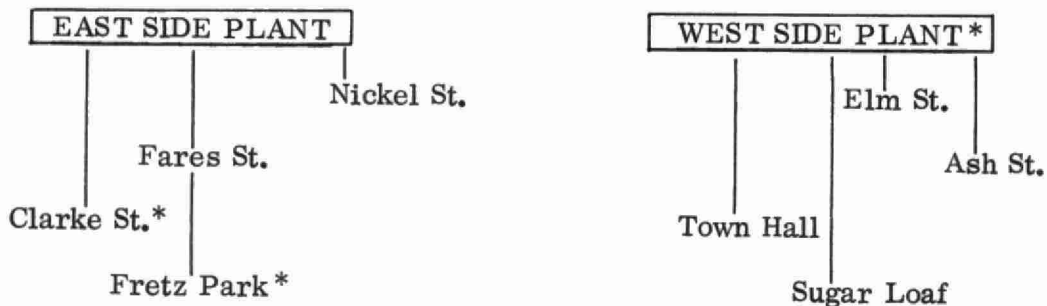
Throughout the year courses and conferences are provided by the OWRC in Toronto for training in the operation of sewage treatment plants. Chief Operator J. Telfer completed a series of three of these courses and received his Certificate of Qualification as a Sewage Works Operator during the past year. J. Blanchard successfully completed the first week of a repeat series of courses. The OWRC Chief Operators Conference, held during the week of October 22nd, was attended by Jim Telfer.

Description of Project

SUMMARY

The geographical location of the Town of Port Colborne and the relatively shallow soil conditions over the underlying bedrock have resulted in the necessity of two sewage treatment plants and an integrated system of pumping stations. The Welland Canal divides the town into two sections, the east side and the west side. Each side is served by a treatment plant which is served in turn by four pumping stations. The entire project is operated by the OWRC.

The following diagrammatic layout indicates the treatment plant and the pumping stations serving each plant. An asterisk behind the name indicates ownership by the OWRC.



The following description includes both the west side and east side plants. However, due to the multitude of pumping stations involved in this project, only the two newest, Clarke Street and Fretz Park, are described in this report.

WEST SIDE SEWAGE TREATMENT PLANT (KING STREET)

GENERAL

The plant is located at the intersection of King and Keefer Streets. It treats the sewage for the section of the town on the west side of the Welland Ship Canal.

The sewage is pumped to the plant by four outlying pumping stations located at Ash Street, Elm Street, Sugar Loaf Street and near the Town Hall.

INFLUENT WORKS

The waste water enters the plant via a 14 inch diameter inlet sewer, passing through one of two manually cleaned bar screens, into the grit channels.

The bar screens prevent large objects from entering the plant. In the grit channels, the velocity of flow is reduced sufficiently to allow settling of the heavier particles of grit and detritus material which otherwise would damage the plant. These channels are operated alternately to allow cleaning of one while the other is in use.

From the grit channels, the flow passes through a Venturi flume, which measures the flow entering the plant and into the primary distribution chamber.

PRIMARY SETTLING

The two circular primary settling tanks receive the waste water from the distribution chamber, which proportionately distributes the flow equally between the two tanks.

These tanks provide a detention period to the flow and allow the heavier organic material (sludge) to settle for removal. The tanks are equipped with sludge scraping and surface skimming mechanisms which draw off the accumulated sludge and scum, depositing the material in a holding pit from which it is pumped to the primary digester for treatment.

The partially settled flow then passes over the effluent weirs to the aeration tanks.

AERATION

The six aeration tanks provide the biological environment required to remove the finely divided, suspended and dissolved organic materials remaining in the flow.

The settled sludge (activated sludge), from the final settling tanks, is recirculated back to the aeration tanks and mixes with the effluent from the primary tanks. The mixed liquid (mixed liquor) is then aerated by the high intensity aerating cones which supply, by their agitating action, the oxygen requirements of the biological communities of aerobic micro-organisms (sludge floc).

(The activated sludge which is returned, acts as the vehicle for the bacteria which in turn oxidizes the organic material).

The mixed liquor then passes into the final distribution chamber.

FINAL SETTLING

The two circular final settling tanks receive the flow from the distribution chamber and provide another detention period to the mixed liquor, for removal of the activated sludge. The tanks are equipped with sludge removal facilities which draw off the activated sludge and return it to the aeration tanks or to waste.

The clarified effluent is then discharged over the effluent weirs to the chlorine contact chamber.

CHLORINATION

The chlorine contact chamber provides another short detention period to ensure overall contact with the chlorine, which is piped in from an automatic proportional chlorinator. The chlorine disinfects the effluent by destroying any remaining bacteria.

The effluent is then discharged to the Welland Canal.

DIGESTION

The digestion in this plant is performed in two stages; called primary and secondary digestion.

The sludge from the primary settling tanks along with waste activated sludge is pumped to the primary digester. In the absence of air, and at a temperature of 90 degrees Fahrenheit, the decomposing or digestion process begins. The sludge is broken down by a bacterial action to a thick, black, odourless liquid. Constant mixing ensures overall treatment.

The secondary digester receives the digested sludge and completes the process. This digester is not agitated but is left in a quiescent state. The supernatant is decanted and returned to the treatment process and the settled digested sludge is pumped out and trucked away for disposal.

During the digestion process, sludge gas (principally methane) is formed and is used as a fuel for the boiler, supplying heat to the buildings and digesters. Standby fuel is oil.

EAST SIDE SEWAGE TREATMENT PLANT (KILLALY STREET)

GENERAL

The plant is located near the intersection of Killaly Street and Welland Street. It treats the sewage for the section of the town located on the east side of the Welland Ship Canal.

The plant is fed by four outlying pumping stations; Fares Street, Nickel Street, Clarke Street and Fretz Park.

INFLUENT WORKS

The waste water enters the plant via two 10-inch force mains passing through one of two manually cleaned bar screens into the grit channels.

The bar screens prevent large objects from entering the plant. In the grit channels the velocity of flow is reduced sufficiently to allow settling of the grit and detritus material which otherwise would damage the plant. These channels are operated alternately to allow cleaning of one while the other is in use.

The flow then passes through a comminutor which further screens the sewage and cuts the screenings into fine particles. It then passes through the screen openings and to the aeration section.

The sewage flow is measured as it passes through a Parshall flume.

AERATION

The four aeration tanks through a detention period provide a biological environment as was described for the King Street plant. The mixed liquor then flows to the final clarifiers.

FINAL SETTLING

Two circular final settling tanks receive the flow and provide another detention period for the removal of activated sludge. The tanks are equipped with sludge removal facilities which return the activated sludge to the aeration tanks or waste. The clarified effluent then discharges over the weirs.

DIGESTION

The digestion in this plant is carried out in one stage.

The waste activated sludge is pumped into the digester. In the absence of air, and at a temperature of 90 degrees Fahrenheit, the decomposition and digestion takes place.

The supernatant is decanted and returned to the plant and the digested sludge is hauled away by tank truck.

CLARKE STREET PUMPING STATION

GENERAL

Located on Clarke Street between Russell Avenue and Killaly Street East. This pumping station serves the north-east section of the town. Sewage is collected in the wet well at the station and is delivered via a force main to the influent channel at the East plant.

EQUIPMENT

This station is equipped with three stereophagus pumps which may operate singly or in parallel depending upon the flow of sewage into the station. These pumps are equipped with a conical impeller and combine a shredding and pumping operation which eliminates the need of comminution facilities at the East Side plant.

The pumps operate on a simple on-off basis and are controlled by the level in the wet well, this level being sensed by electrodes set at appropriate elevations.

There is no standby power in the event of a local electric power failure. To avoid surcharging of the sewers in such an instance, an overflow pipe has been provided leading from the wet well to a nearby ditch.

FRETZ PARK PUMPING STATION

GENERAL

Located on Johnston Street between James and Mercury Avenue, this pumping station serves the southeast section of the town. Sewage is collected in the wet well at the station and is delivered via a force main to the influent channel at the East Side plant.

EQUIPMENT

This station is equipped with two stereophagus pumps which may operate singly or in parallel depending upon the flow of sewage. These pumps, as do those in the Clarke Street station, combine a shredding and pumping operation. The pumps are controlled by electrodes located in the wet well.

In the event of a power failure, rather than an overflow pipe as is provided at the Clarke Street station, a standby natural gas engine has been installed. This engine starts automatically in the event of an interruption in the local hydro and by means of a right angle drive mechanisms, serves as power to one pump until service is resumed.

Design—Data

WEST SIDE PLANT

GENERAL

Type of Plant - Activated sludge process.

Design Population - 9,000 persons.

Per Capita Flow - 100 gallons per capita per day.

Design Plant Flow - Dry weather flow 900,000 gallons per day (DWF). Combined flow 3,600,000 gallons per day (4 DWF).

Five Day BOD -

Raw Sewage - 225 PPM

Removal - 93%

Suspended Solids -

Raw Sewage - 300 PPM

Removal - 93%

INFLUENT SEWER -

14 inch diameter force main.

SCREENS

Located before the grit channels and manually cleaned. Two bar screens with 1 inch spaces.

GRIT CHANNELS

Two parallel units.

Length - 40 ft. 4" - Width - 1 ft. 10"

Cross-Sectional area - 1.67 square feet.

Volume - 67.3 cubic feet = 419 gallons.

Detention at Design Flow (DWF) - 0.67 minutes.

Velocity - 1 ft. per second.

A grit trough is provided which discharges to a wheelbarrow.

PRIMARY CLARIFIERS

Two units, circular.

Size - 50 ft. diameter by 9 ft. liquid depth.

Volume (2 units) - 35,300 cubic feet = 220,000 gallons.

Detention at Design Flow - 5.87 hours.

PRIMARY CLARIFIERS - Continued

Surface Settling Rate - 229 gallons per square foot of tank per day.
Weir Overflow Rate - 2860 gallons per lineal foot of weir per day.
Equipment - Dorr-Oliver-Long Limited.

RAW SLUDGE PUMPS

Two - Carter plunger type 75 GPM at a TDH of 30 feet and driven
by 3 HP General Electric motors.

AERATION SECTION

Type - Surface aeration.
Six units square.
Size of Each Unit - 30 ft. x 30 ft. x 10.5 Ft. (normal W.L.)
Volume (6 units) - 52,300 cubic feet = 326,000 gallons.
Detention at Design Flow = 8.7 hours.
Detention at Design Flow - 6.7 hours (including 30% return sludge).
BOD Loading - 26 lbs. BOD per day per 1,000 cubic feet of aerator
(assuming 35% BOD reduction in the primary).
Equipment - Ames Crosta Mills Limited.

FINAL CLARIFIERS

Two units, circular.
Size - 45 ft. diameter by 8 ft. liquid depth.
Volume (2 units) - 25,500 cubic feet = 159,500 gallons.
Detention at Design Flow - 4.24 hours.
Surface Settling Rate - 282 gallons per square foot of tank per day.
Weir Overflow Rate - 3,200 gallons per lineal foot of weir per day.
Equipment - Ames Crosta Mills Limited.

ACTIVATED SLUDGE PUMPS

Three - Ames Crosta pumps rated at 315 GPM at a TDH of 30 feet
and driven by a 7.5 HP Brooks Huddersfield motors.

CHLORINE CONTACT CHAMBER

One unit - rectangular.
Volume - 16,060 cubic feet = 100,000 gallons.
Contact Period at Design Flow - 16 minutes.

CHLORINATORS

Storm Flow Chlorinator - Wallace and Tiernan series A-731,
V-notch.
Main Flow Chlorinator - Wallace and Tiernan series A-731,
V-notch.
Maximum capacity of each chlorinator is 400 lbs. of chlorine per
day.

DIGESTERS

Two units, one heated circular primary with floating cover and one unheated circular secondary.
Size of Primary - 35 ft. diameter by 22 ft. depth.
Volume of Primary - 21,200 cubic feet.
Capacity of Primary - 2.34 cubic feet per capita.
Mixing of Primary - Dorr draft tube mixer.
Operating Temperature - for the primary is 90° - 95° F. accomplished by a spiral heat exchanger capable of transferring 200,000 BTU's per hour.
Size of Secondary - 30 ft. diameter by 19 ft. depth.
Volume of Secondary - 13,400 cubic feet.
Capacity of Secondary - 1.49 cubic feet per capita.
Loading (2 units) - 2.18 lbs. of solids per cubic feet of tank per month.
Equipment - Dorr-Oliver-Long Limited.

HEAT EXCHANGER

One No. 25 spiral heat exchanger manufactured by Dorr-Oliver capable of transferring 200,000 BTU's per hour from the hot water to the sludge.

SLUDGE RECIRCULATING PUMPS

Two - Wemco sludge recirculating pumps rated at 62.5 GPM at a TDH of 40 feet driven by 5 HP General Electric motors.

SLUDGE TRANSFER PUMP

One Carter duplex plunger pump rated at 125 GPM.

DIGESTER MIXER

One Dorr-Oliver draft tube mixer located in the primary digester.

MISCELLANEOUS EQUIPMENT

Boiler is a Cleaver-Brooks, rated at 500,000 BTU per hour, operating on digester gas with natural gas standby.

Boiler Water Recirculating Pump - Ingersoll 33.4 GPM at a TDH of 32 feet driven by a 3/4 HP Doerr electric motor.

Building Hot Water Circulating Pump - Armstrong, 1 1/2 inch, driven by a 1/6 HP motor.

Froth Spray Pump - driven by a Westinghouse 10 HP motor.

Digester Building Sump Pump - 1 Smart-Turner 20 GPM at a TDH of 20 feet driven by a 1/2 HP General Electric motor.

Administration Building Sump Pump - 1 Smart-Turner 20 GPM at a TDH of 20 feet driven by a 1/2 HP General Electric motor.

Digester Gas Booster Pump - 1 Rootes-Connersville positive displacement pump driven by a 1/2 HP General Electric motor.

FLOW MEASUREMENT

Main sewage flow.
Sewage to aeration.
Total activated sludge.
Return activated sludge.

DESIGN DATA - EAST SIDE PLANT

GENERAL

Type of Plant - Activated sludge without primary tanks.

Design Plant Flow - 850,000 gallons per day.

GRIT CHANNELS

Two parallel channels, 15 ft. long. Each channel equipped with bar screens at the head of the channel.

COMMINUTION

One comminutor - Jones Atwood Limited with a .75 HP motor.

AERATION SECTION

Four units, square. Each unit 30 ft. x 30 ft. x 16 ft.
Volume (four units) 44,200 cubic feet = 276,000 gallons.
Retention period - 7.8 hours.
Retention period - 6.0 hours (30% return sludge).
Equipment - Ames Crosta Mills Limited.

FINAL CLARIFIERS

Two units, circular. Each unit 30 ft. diameter x 8 ft.
Volume (two units) 11,300 cubic feet - 70,400 gallons.
Retention period - 2.0 hours.
Surface Settling Rate - 601 gallons per square foot of tank per day.
Weir Overflow Rate - 4,520 gallons per lineal foot of weir per day.
Equipment - Ames Crosta Mills Limited.

ACTIVATED SLUDGE PUMPS

Three - Ames Crosta Mills with 3 HP motors.

DIGESTER

One unit, circular, single stage.

Size - 50 ft. diameter x 22 ft. 10 in. depth or SWD.

Volume - 44,800 cubic feet = 280,000 gallons.

Heated sludge is recirculated to maintain a temperature of approximately 90° F.

Equipment - Pacific Flush Tank

SLUDGE RECIRCULATION PUMP

One - Fairbanks-Morse 250 GPM at 35 ft. head with a 3 HP motor.

MISCELLANEOUS EQUIPMENT

One - Water circulating pump - Armstrong with 6 HP motor.

Two - Sludge pumps - Smart-Turner 100 GPM at 27 ft. head with 3 HP motors.

FLOW MEASUREMENTS

Raw sewage meter.

Return sludge meter.

CLARKE STREET PUMPING STATION

PUMPS

Three Pulsometer vertical spindle stereophagus.

CAPACITY

No. 1 - 600 GPM at 70 ft. TDH.

No. 2 - 600 GPM at 70 ft. TDH.

No. 3 - 250 GPM at 27 ft. TDH.

MOTORS - 2

Two - 30 HP Bull.

One - 7.5 HP Bull

CONTROLS

"Noflote" electrodes.

FRETZ PARK PUMPING STATION

PUMPS

Two Pulsometer vertical spindle stereophagus pumps.

CAPACITY

No. 1 - 750 GPM at 65 ft. TDH.

No. 2 - 750 GPM at 65 ft. TDH.

MOTORS

Two - 30 HP Bull.

CONTROLS

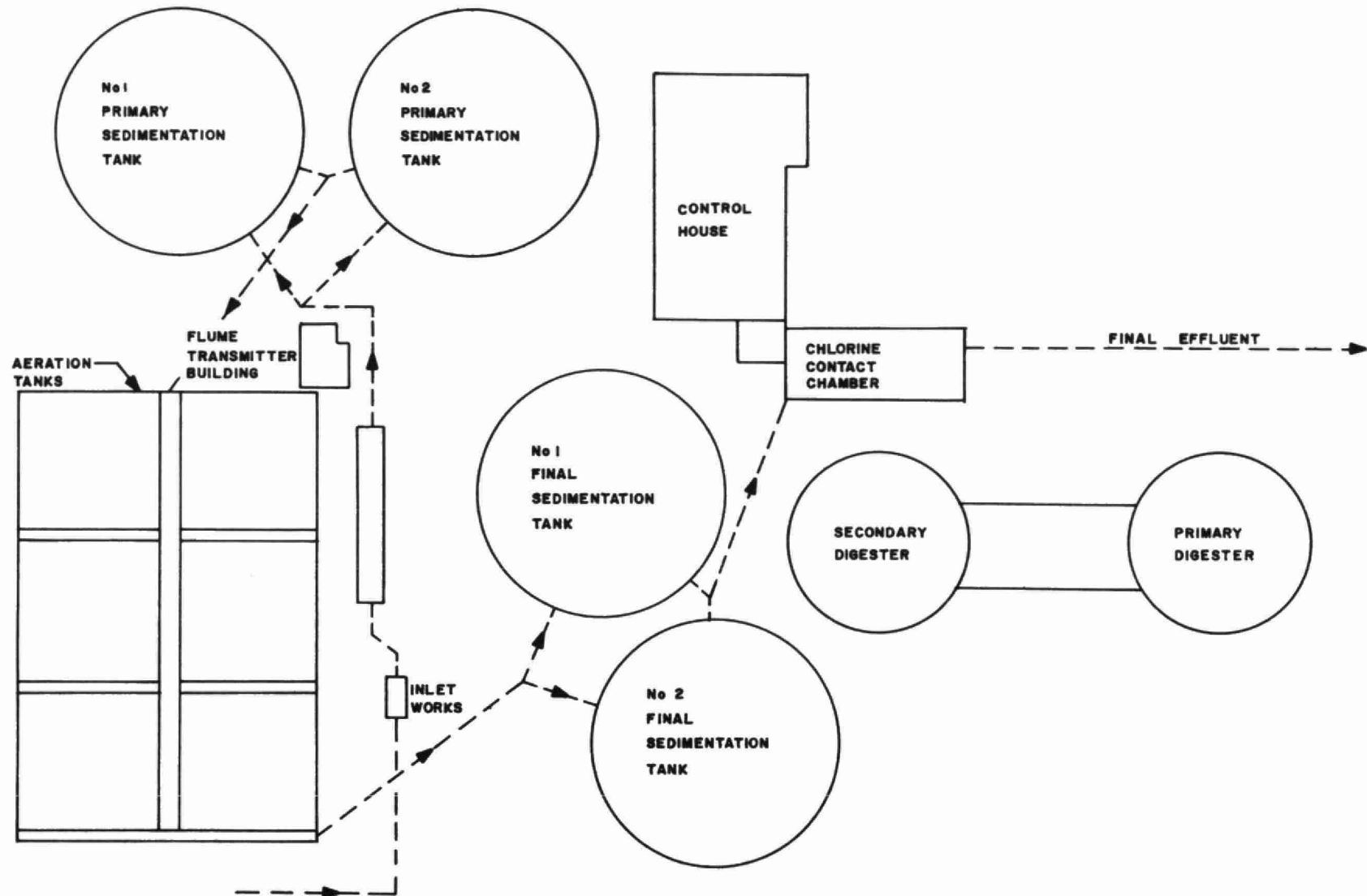
"Noflote" electrodes.

STANDBY ENGINE

Waukesha - Model XA-HU

Fuel is natural gas.

PORT COLBORNE SEWAGE TREATMENT PLANT
WEST SIDE PLAN



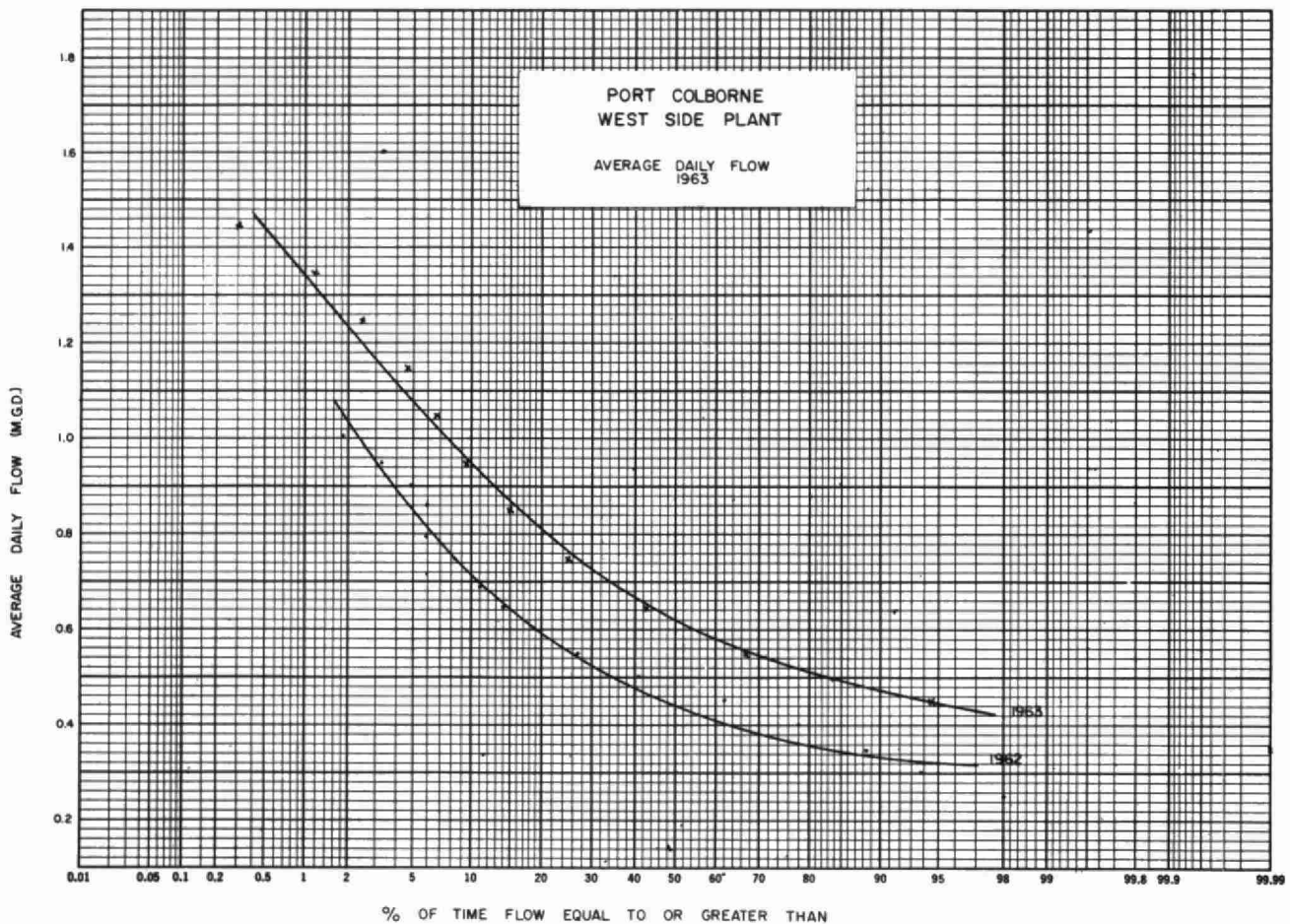
Process Data

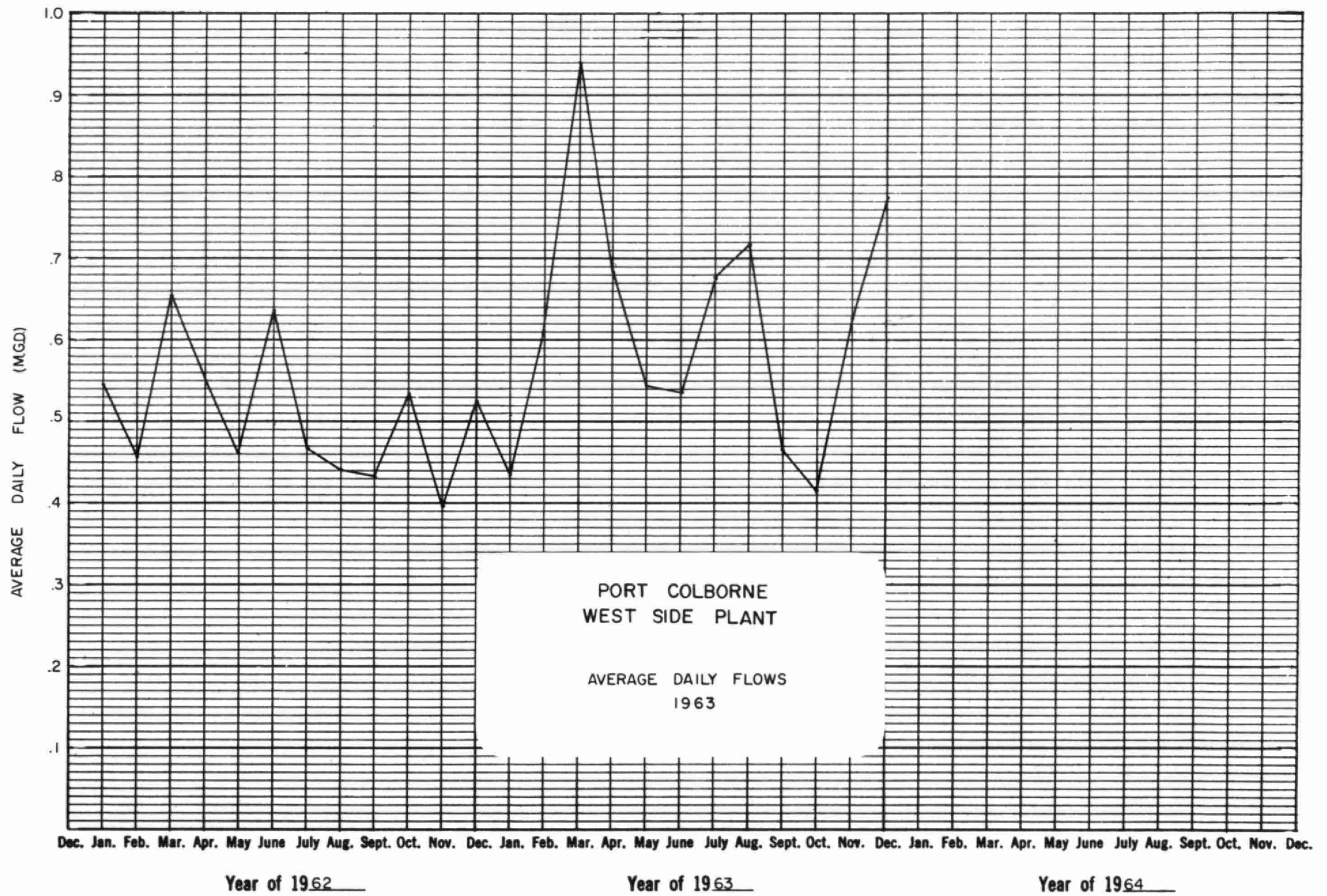
PROCESS DATA - WEST SIDE PLANT

FLOW

During 1963, a total of 225.388 million gallons of sewage was given secondary treatment. This represents an average daily flow of 0.618 million gallons as opposed to 0.507 million gallons in 1962. This is an increase of 21.9%.

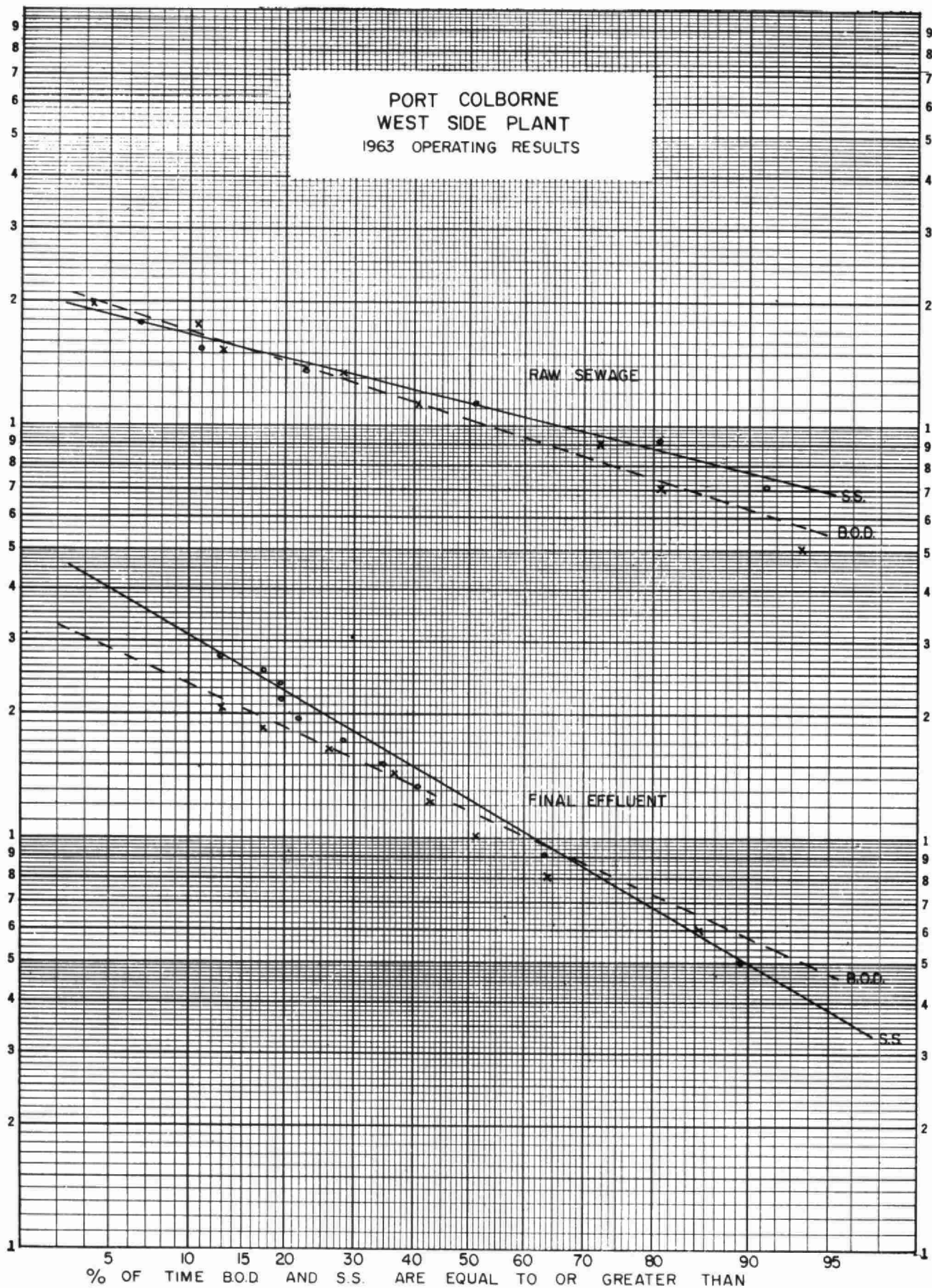
The maximum 24 hour daily flow of 2.1 million gallons occurred in April and the maximum average daily flow for one month of 0.652 million gallons occurred in March.

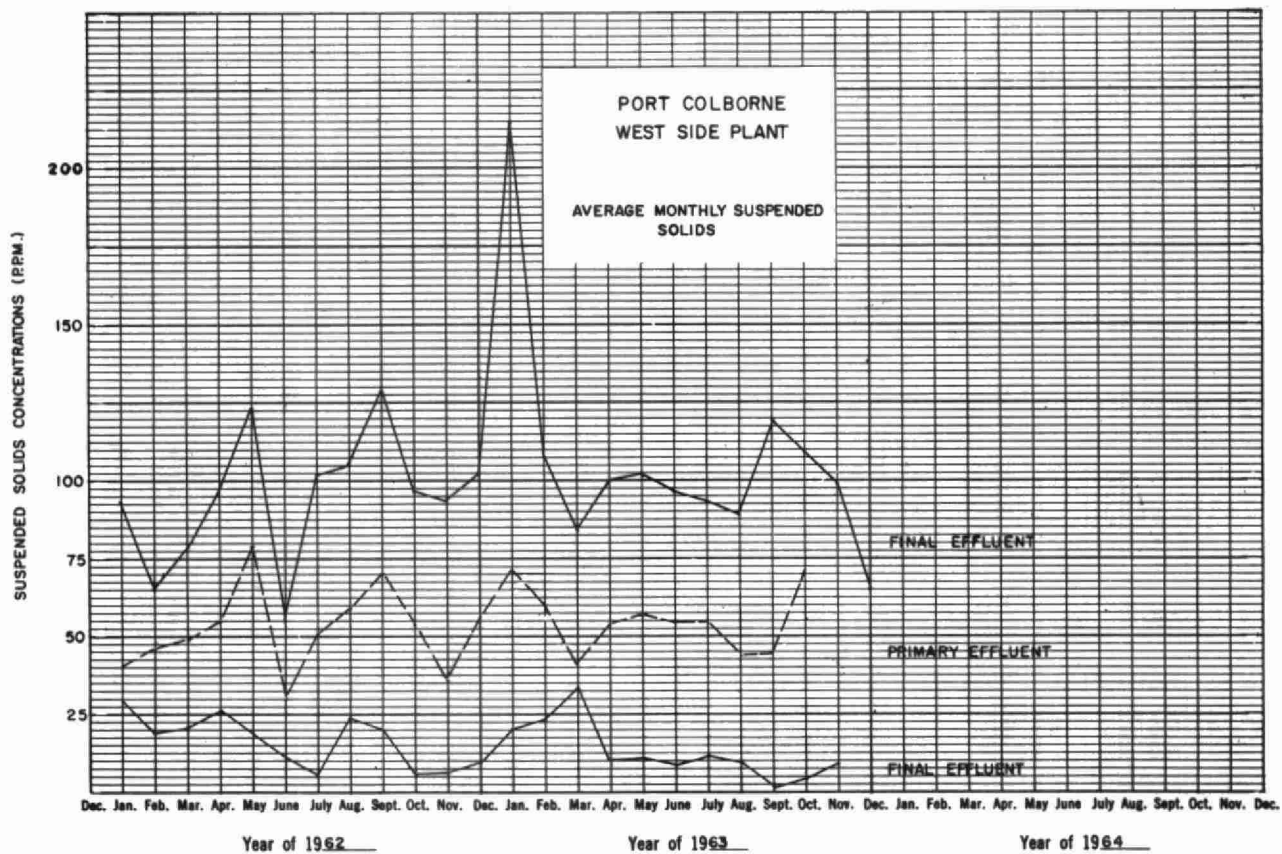
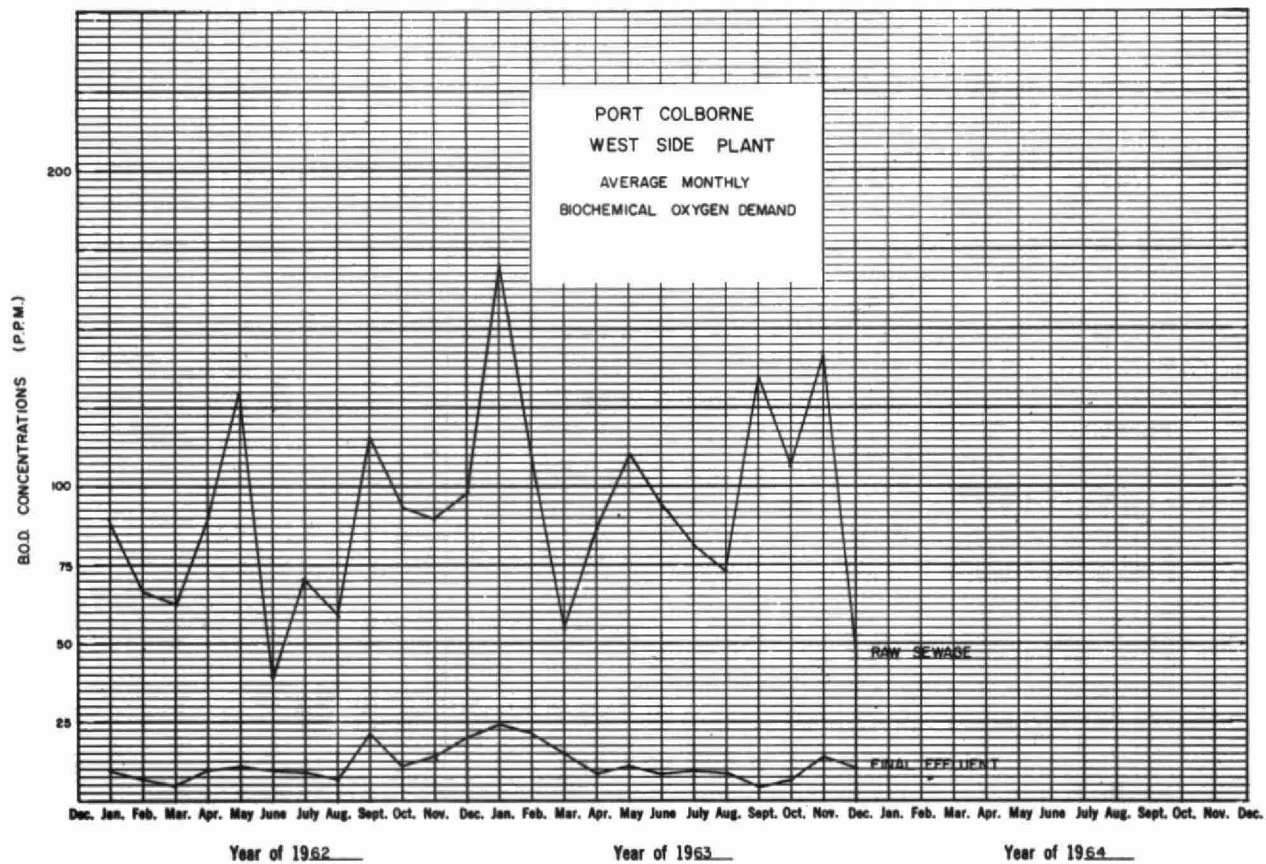




PORT COLBORNE
WEST SIDE PLANT
1963 OPERATING RESULTS

BOD AND SS. CONCENTRATIONS IN PPM.





GRIT, B.O.D AND S.S. REMOVAL

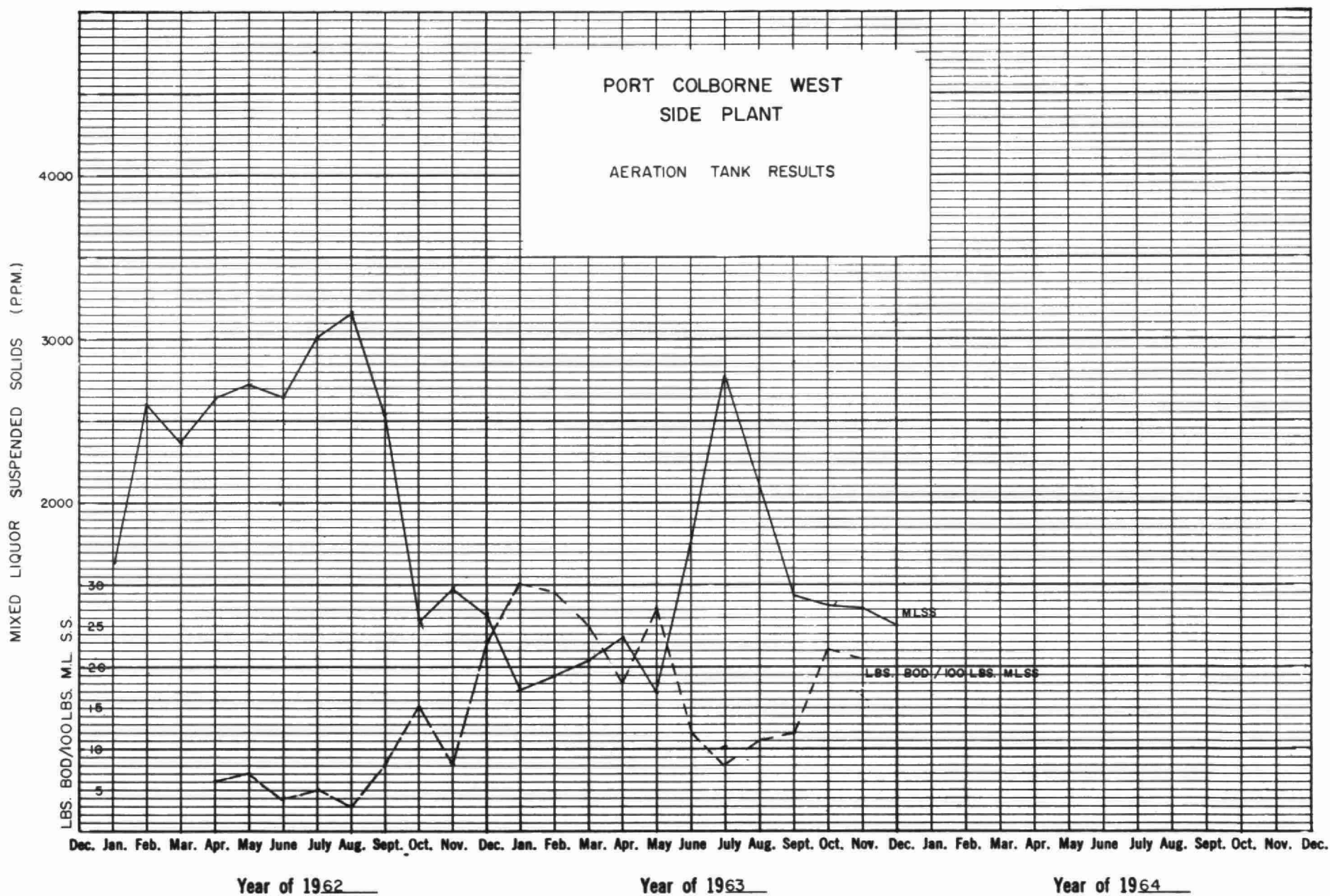
WEST SIDE PLANT

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	169	24.0	85.5	9.7	214	20.0	90.5	12.7	
FEB.	108	22.0	79.5	7.3	100	23.0	77.0	6.5	
MAR.	54	15.0	72.0	5.6	84	33.0	60.5	7.4	
APR.	87	8.0	91.0	8.1	100	10.0	90.0	9.2	
MAY	110	10.0	91.0	8.4	102	11.0	89.0	7.6	
JUNE	93	5.8	93.5	6.9	96	8.0	91.5	7.0	
JULY	81	9.0	89.0	7.5	93	12.0	87.0	8.5	
AUG.	73	8.0	89.0	7.2	88	9.0	89.5	8.7	
SEPT.	134	4.5	97.0	9.0	119	2.0	98.5	8.1	
OCT.	107	7.0	93.5	6.4	109	4.0	96.5	6.7	
NOV.	142	13.0	91.0	12.1	98	8.0	92.0	8.4	16.0
DEC.	46	10.0	78.0	4.3	65	6.0	90.5	7.1	6.5
TOTAL				92.5				97.9	22.5
AVG.	100.3	11.4	87.5	7.7	105.7	12.2	88.6	8.2	

COMMENTS

An average loading of 100.3 PPM BOD and 105.7 PPM suspended solids was encountered in the raw sewage in 1963. Both the quantity and the quality of this sewage remains below the design criteria of the West Side plant set at 900,000 GPD with a strength of 225 PPM BOD and 300 PPM suspended solids.

The final effluent exceeded the OWRC objectives for secondary treatment plants of 15 PPM for BOD and suspended solids 32% and 40% of the time for suspended solids and BOD respectively. The average efficiencies of removal of 87.5 and 88.6% are quite satisfactory and became more consistent as the year progressed.



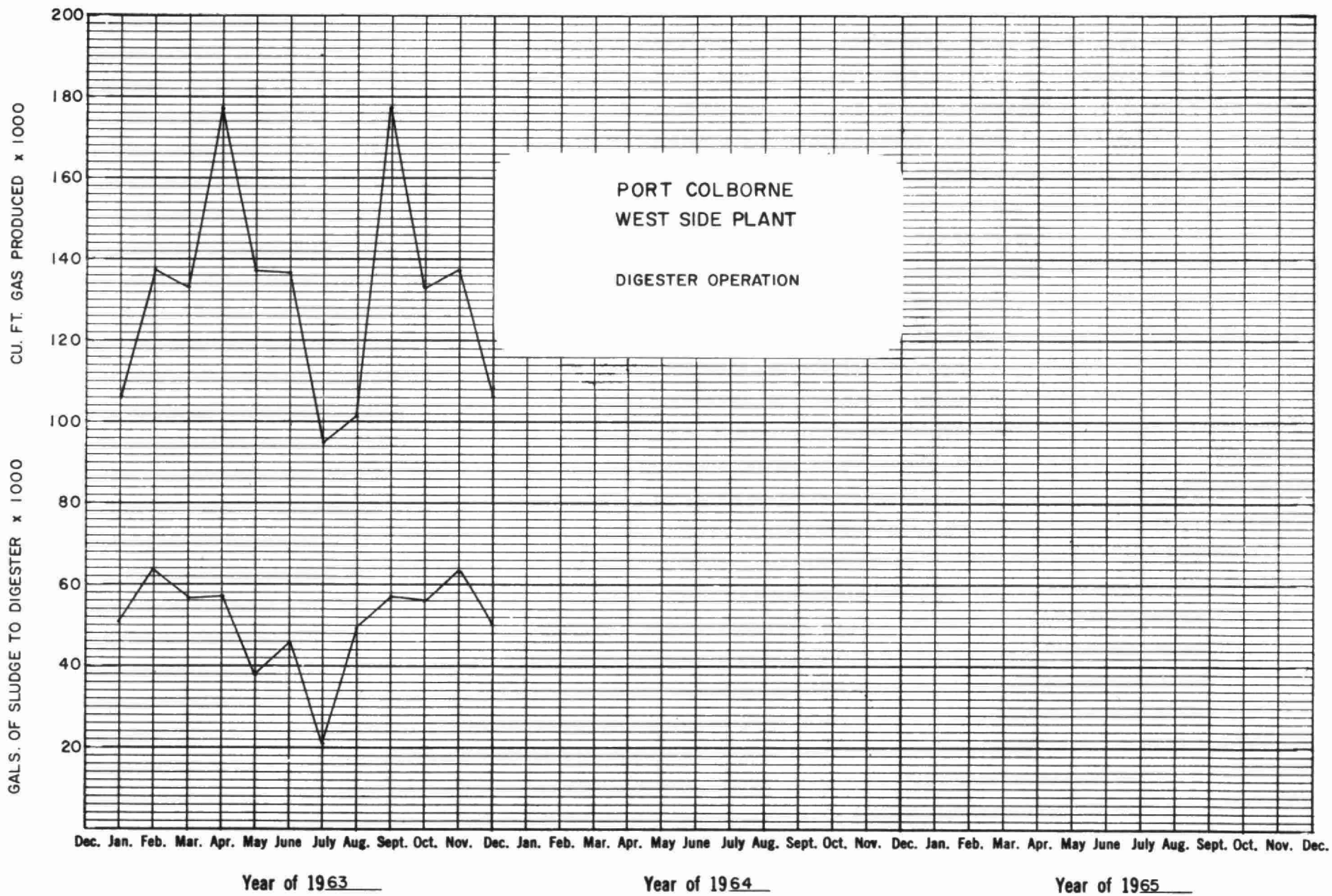
AERATION SECTIONWEST SIDE PLANT

MONTH	PRIM. EFFL. B.O.D. PPM.	ML.SS. PPM.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	82	854	30	
FEBRUARY	75	946	29	
MARCH	39	1046	24	
APRIL	51	1185	18	
MAY	70	845	28	
JUNE	59	1752	12	
JULY	56	2771	8	
AUGUST	56	2091	11	
SEPTEMBER	70	1434	12	
OCTOBER	122	1371	22	
NOVEMBER	62*	833	20	
DECEMBER	61	1254	21	
TOTAL	62	1365	20	
AVERAGE				

* Estimated figure.

COMMENTS

Due to the low organic loading on this plant, it is necessary to operate only one half of the aeration section. However, the hydraulic load being 68% of design, results in a slightly reduced detention period in the aeration section. To overcome this reduced detention period, the suspended solids are carried slightly higher than recommended resulting in a reduced food to micro-organism ratio.



DIGESTER OPERATION**WEST SIDE PLANT**

MONTH	SLUDGE TO DIGESTERS			% VOL. MAT IN DIGESTED SLUDGE	GAS PRODUCED 1000'S CU. FT.	SLUDGE FROM DIGESTER 1000'S GALS
	1000'S GALLONS	% SOLIDS	% VOL. MAT.			
JAN.	67.49	7.1	80.6		102.6	
FEB.	17.29	7.5	82.7		96.9	7.2
MAR.	13.87	7.0	76.8		69.9	
APR.	23.84	6.5	77.9		95.5	4.8
MAY	38.20	5.5	77.8		137.2	
JUNE	45.69	4.6	76.5		136.6	18.00
JULY	20.46	5.0	77.5		94.7	22.80
AUG.	49.17	4.2	70.8	56.6	101.1	14.40
SEPT.	57.25	3.0	76.3	41.9	177.1	27.60
OCT.	56.58	2.9	79.0		133.6	10.80
NOV.	63.67	2.9	79.5	75.5	137.5	31.20
DEC.	50.60	3.8	77.2		106.8	49.20
TOTAL	504.09				1389.5	186.00
AVG.	42.01	5.0	77.7	58.0	115.8	15.50

COMMENTS

A total of 504,090 gallons of raw sludge representing an increase of 9.1% over 1962 was pumped to the digester in the past year. An average concentration of 5.0% solids in the raw sludge was attained which represents a total of 279,560 pounds of total solids.

Approximately 63% of the digester contents was returned to the plant as supernatant, accounting for the difference between sludge into and sludge out of the digesters.

A total of 1,389,500 cubic feet of methane gas was produced supplementing the fuel supply at the plant.

Digested liquid sludge is removed at this project by contract. During 1963, 1105 cubic yards of sludge were hauled from this plant at an average cost of 58¢ per yard.

CHLORINATIONWEST SIDE PLANT

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	13.354	691	5.2
FEBRUARY	16.904	502	3.0
MARCH	29.144	725	2.5
APRIL	20.467	522	2.6
MAY	16.786	484	2.9
JUNE	15.983	448	2.8
JULY	20.993	954	2.1
AUGUST	22.239	868	3.9
SEPTEMBER	13.933	1041	7.5
OCTOBER	12.840	1599	12.5
NOVEMBER	18.774	2100	11.2
DECEMBER	23.969	760	3.2
TOTAL	225.386	10,694	
AVERAGE			4.95

COMMENTS

Chlorination of the final effluent is on a yearly basis at this plant. During the past year, chlorine requirements were fairly constant for nine months. However, during September, October and November, low flow resulted in stale, raw sewage which was quite obnoxious. It was necessary to chlorinate in the influent works to avoid odours. Also, during this period, the quality of the final effluent deteriorated due to the nature of the raw sewage resulting in an increased dosage in order to obtain a safe residual.

PROCESS DATA - EAST SIDE PLANT

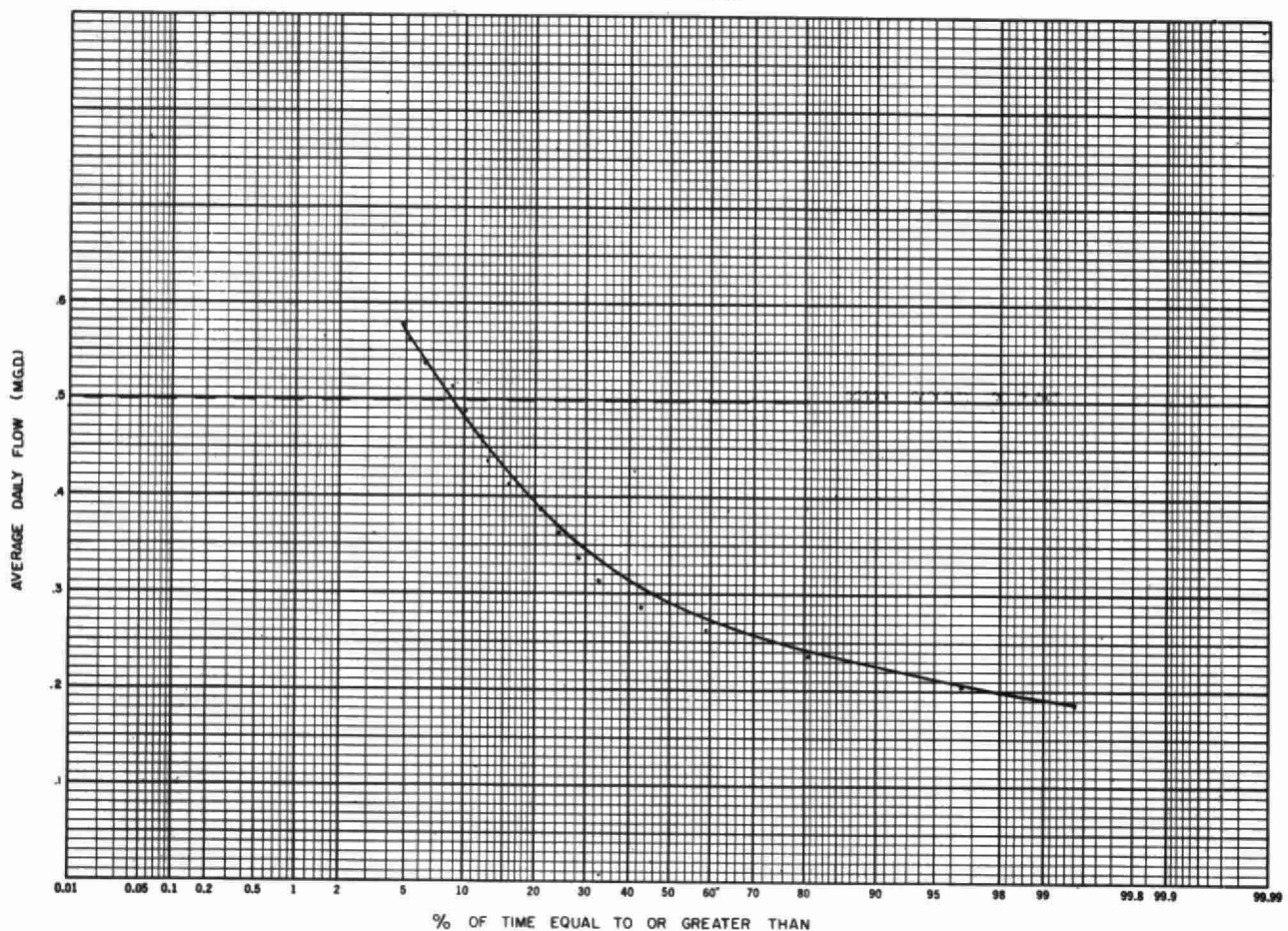
FLOW

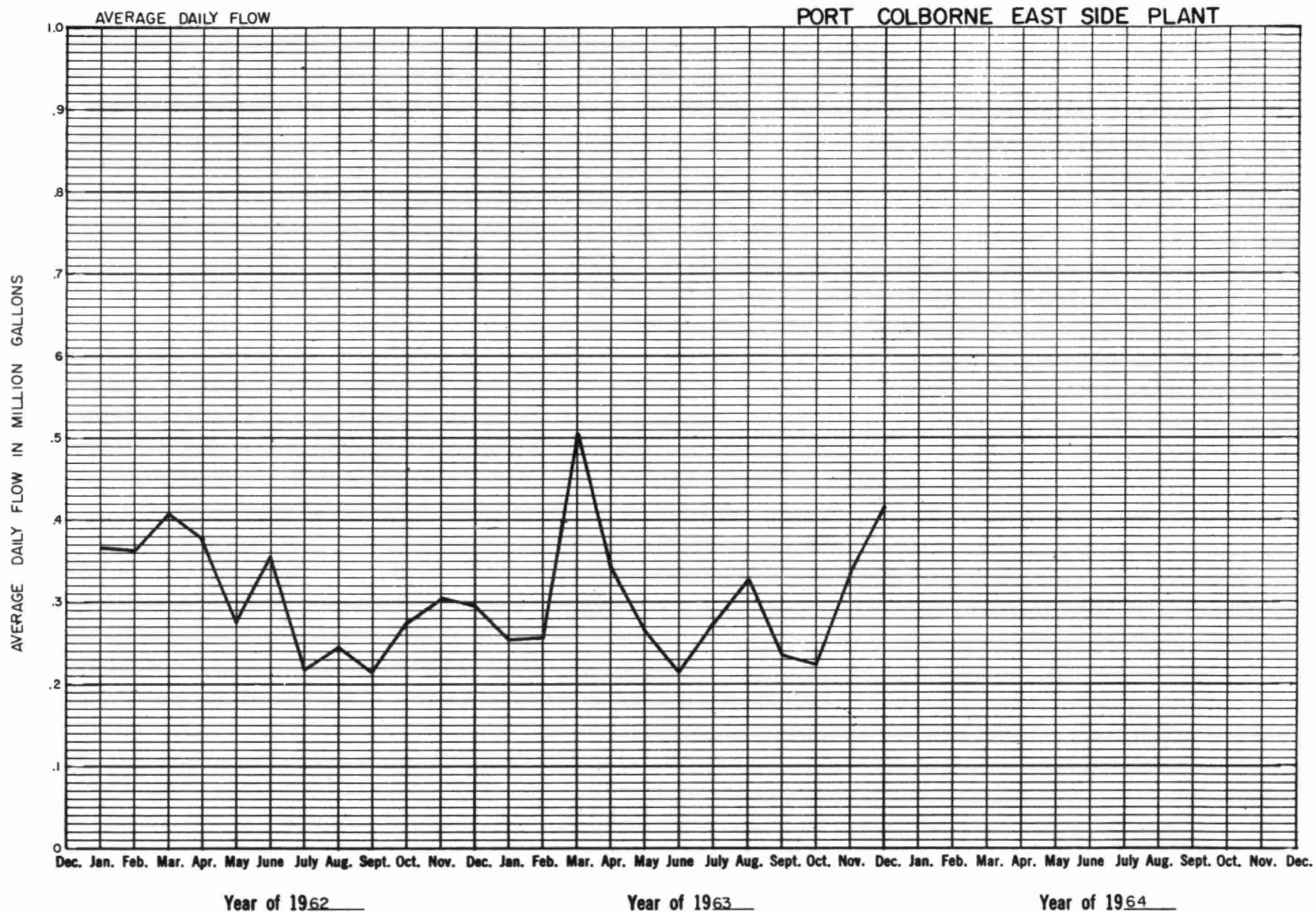
The total flow for 1963 of 111.009 million gallons is a decrease of 0.88% as compared to the 1962 total flow of 111.996 million gallons.

The maximum 24 hour flow in the past year was 562,000 gallons and occurred in the month of March as did the greatest average daily flow for one month of 503,000 gallons.

The design capacity of the plant of 850,000 gallons was never exceeded on an average daily flow basis and 50% of the time the flow was equal to or greater than 290,000 gallons.

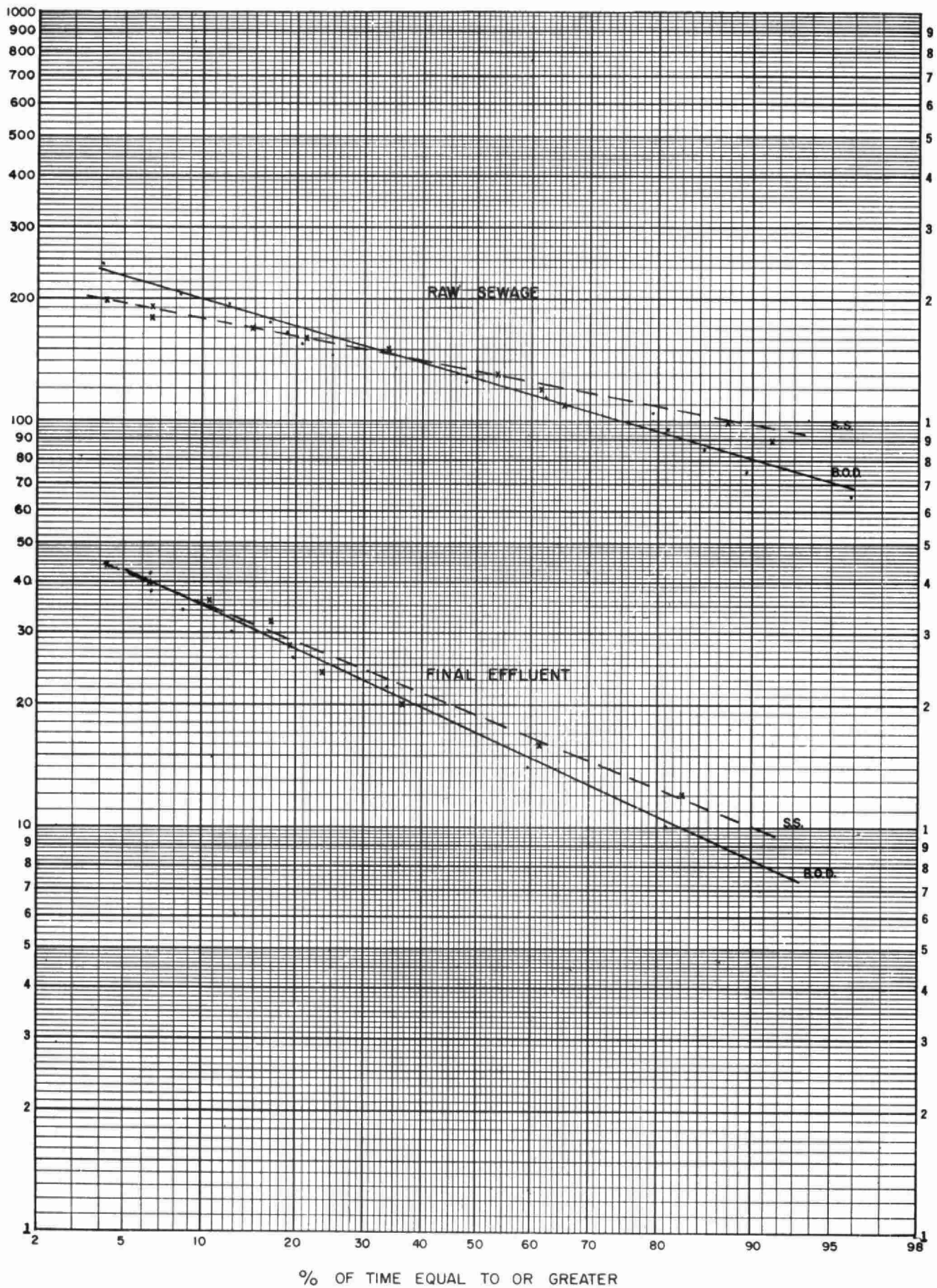
PORT COLBORNE EAST SIDE PLANT
AVERAGE DAILY FLOWS

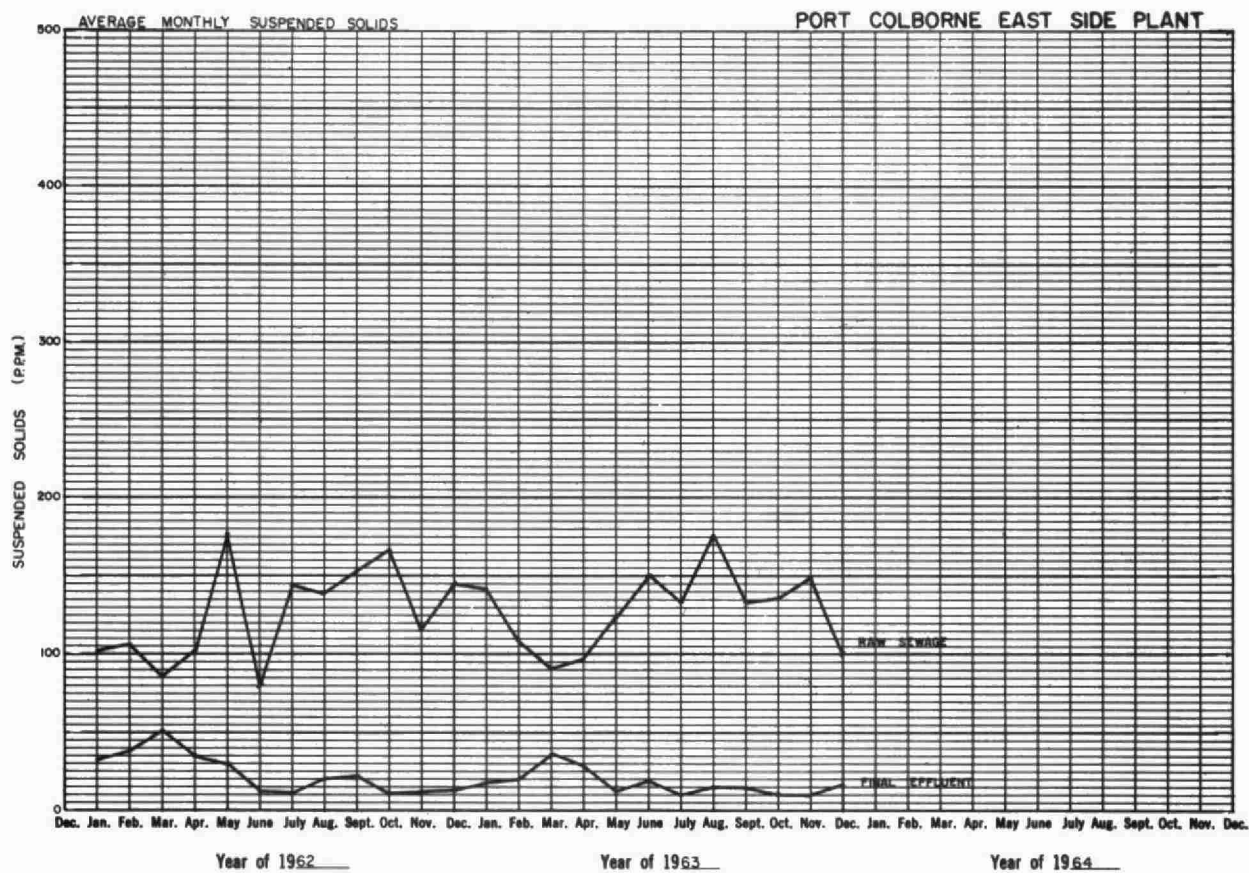
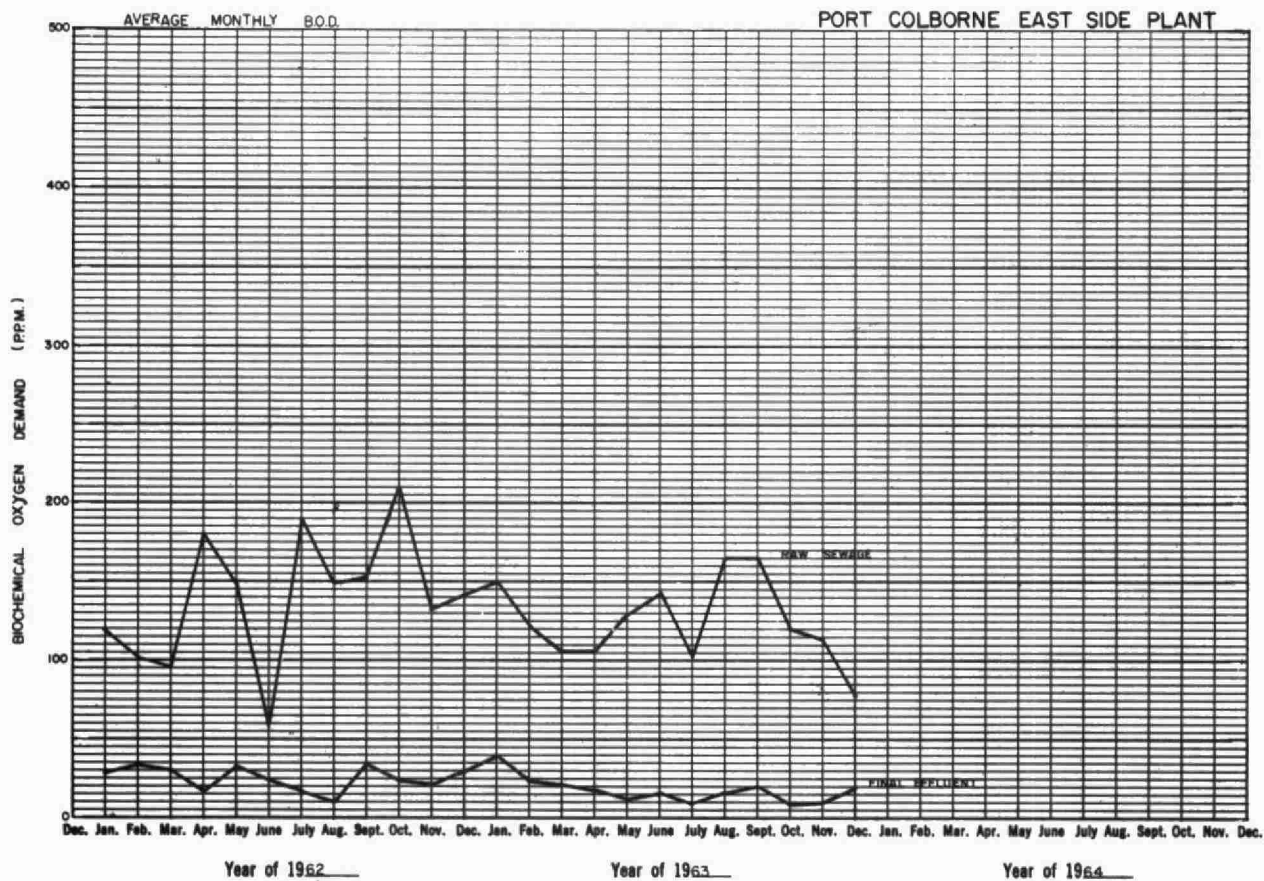




PORT COLBORNE EAST SIDE PLANT

B.O.D. & S.S. IN PPM



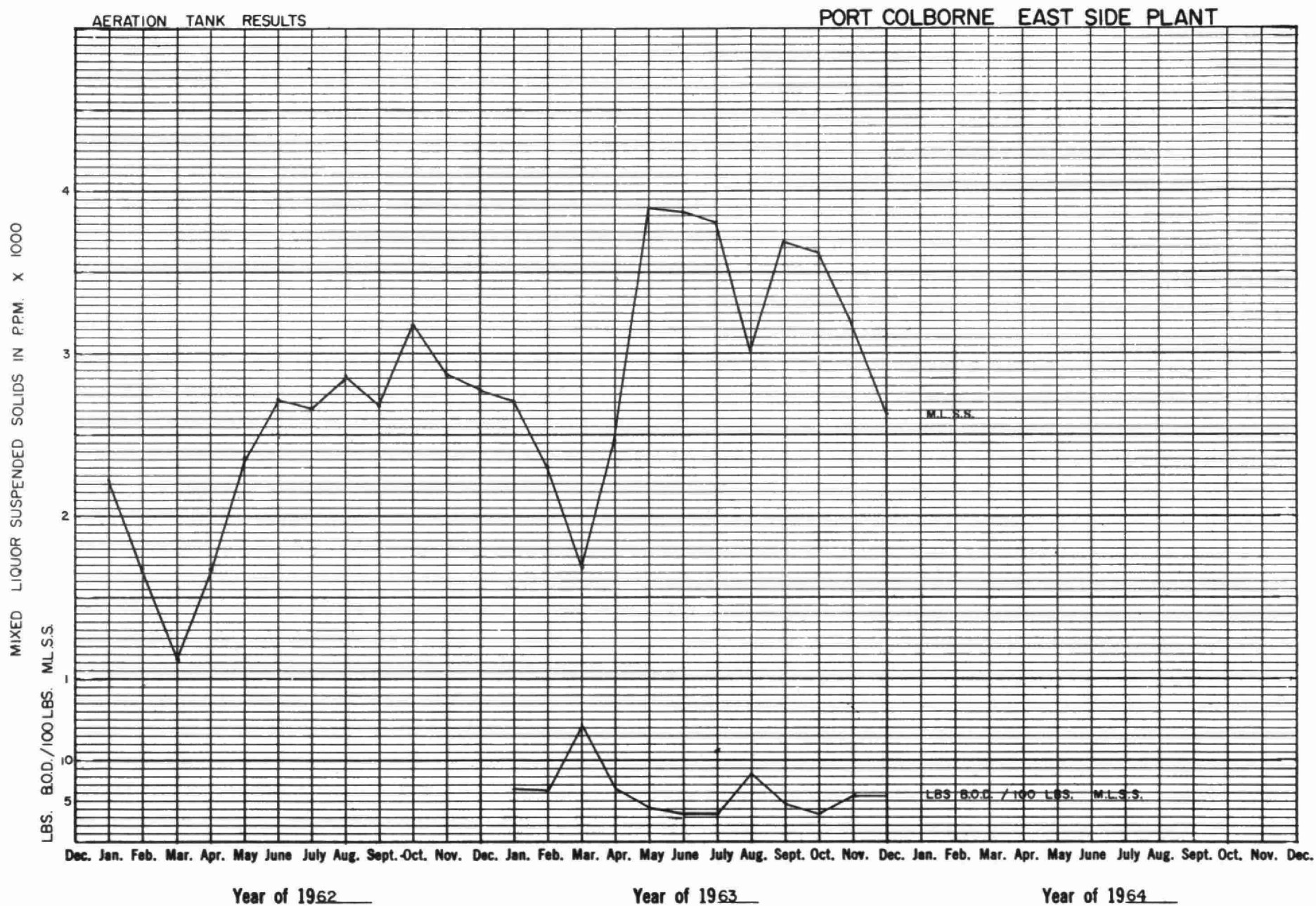


GRIT, B.O.D AND S.S. REMOVAL**EAST SIDE PLANT**

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	149	39	74.0	4.32	142	18	87.5	4.88	
FEB.	122	24	80.5	3.52	108	20	81.5	3.18	70
MAR.	106	21	80.0	6.63	91	36	60.5	4.28	
APR.	106	17	84.0	4.54	97	28	71.0	3.52	30
MAY	129	12	90.5	4.84	124	12	90.5	4.63	
JUNE	142	15	89.5	4.11	150	19	87.5	4.24	20
JULY	103	9	91.0	3.95	133	10	92.5	5.09	14
AUG.	165	16	90.5	7.56	176	15	91.4	8.18	42
SEPT.	165	20	88.0	5.12	133	15	88.5	4.16	52
OCT.	120	9	92.5	3.84	136	10	92.6	4.36	28
NOV.	114	10	91.0	5.20	149	10	93.0	6.97	30
DEC.	78	19	75.5	3.78	100	16	84.0	5.35	28
TOTAL				57.41				58.84	314
AVG.	125	18	85.6	4.78	128	17	85.0	4.90	26

COMMENTS

An average loading of 125 PPM BOD and 128 PPM suspended solids was encountered in the raw sewage in 1963. The final effluent exceeded the OWRC objectives* 59% of the time for BOD and 68% of the time for suspended solids. The efficiencies of removal were 85.6% and 85.0% for BOD and suspended solids respectively. There was 2.8 cu. ft. of grit removal per million gallons.



AERATION SECTION**EAST SIDE PLANT**

MONTH	PRIM. EFFL B.O.D. PPM.	INFLUENT BOD PPM	LBS BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	149	2700	6	
FEBRUARY	122	2304	6	
MARCH	106	1683	14	
APRIL	106	2460	7	
MAY	129	3906	4	
JUNE	142	3871	4	
JULY	103	3804	3	
AUGUST	165	3016	8	
SEPTEMBER	165	3685	5	
OCTOBER	120 *	3623	3	
NOVEMBER	114	3193	5	
DECEMBER	78	2628	6	
TOTAL				
AVERAGE	124.9	3072.8	5.9	

COMMENTS

Due to the high storm flows which are experienced at this plant, the suspended solids concentration in the aeration tank tend to fluctuate widely. During periods of peak flows, hydraulic overloading makes it difficult to retain activated sludge. For this reason, the aeration suspended solids are kept at a relatively high level averaging 3073 PPM. In this way, some solids may be lost without endangering the process in general.

DIGESTER OPERATION**EAST SIDE PLANT**

MONTH	SLUDGE TO DIGESTERS			% VOL. MAT IN DIGESTED SLUDGE	GAS PRODUCED 1000'S CU. FT.	SLUDGE FROM DIGESTER 1000'S GALS
	1000'S GALLONS	% SOLIDS	% VOL. MAT.			
JAN.	93.0	2.2	76			60
FEB.	84.0	2.1	80			27.6
MAR.	76.3	2.2	77			21.6
APR.	46.5	2.6	77			7.2
MAY.	62.3	2.3	79			
JUNE	75.0	2.5	75			3.6
JULY	76.5	2.4	73			56.4
AUG.	74.5	3.2	53			12.0
SEPT.	75.0	2.5	65			21.6
OCT.	77.5	2.3	70			54.0
NOV.	75.5	2.0	67			26.4
DEC.	79.5	2.5	76			22.8
TOTAL	895.5					313.2
AVG.	74.6	2.4	72			26.1

COMMENTS

A total of 895,500 gallons of activated sludge was wasted to the digesters during the past year. After undergoing anaerobic digestion, much of the liquid portion of the digested sludge was returned to the plant as supernatant.

Digested liquid sludge is hauled from this plant. During 1963, 1858.9 cubic yards were hauled at an average cost of 48¢ per yard.

1963

PLANT

Total Operating Costs

MONTHLY

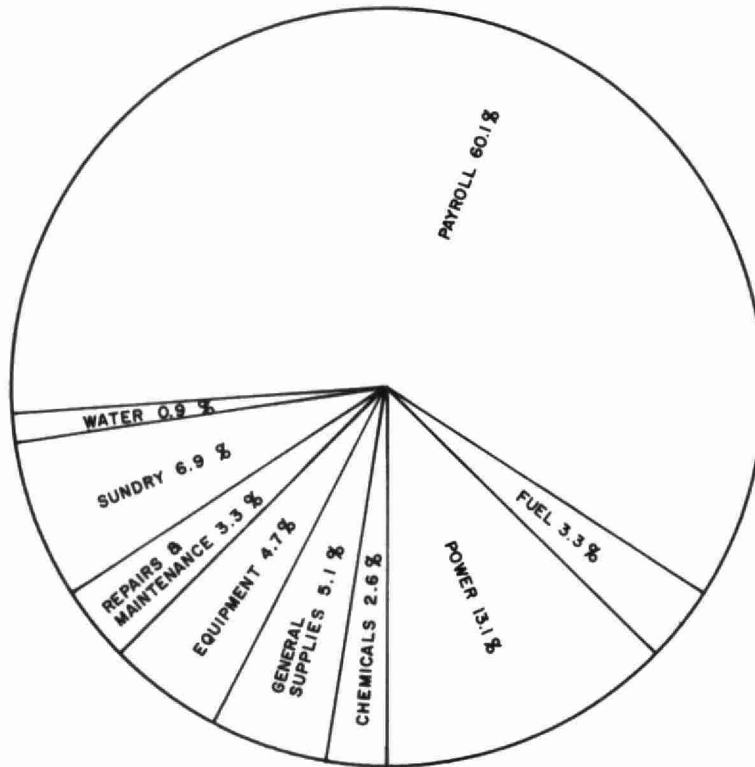
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER
JAN	3,121.77	2687.72	-	185.38	-	-	20.93	-	-	227.74	-
FEB	6,424.85	2687.72	-	237.56	778.02	-	169.42	2105.97	97.96	204.17	144.03
MARCH	6,019.50	2687.72	-	186.76	715.34	574.03	323.49	-	-	1532.16	-
APRIL	4,090.15	2687.72	-	180.18	750.34	(902.74)	400.67	54.64	626.19	293.15	-
MAY	5,763.90	3140.66	-	544.24	712.20	224.03	198.08	-	261.77	551.25	131.67
JUNE	4,092.11	2793.32	-	32.76	524.69	-	293.84	329.11	61.32	57.07	-
JULY	6,136.58	4189.98	-	62.16	575.22	224.03	263.11	324.27	522.64	65.17	-
AUG	3,848.73	2793.32	-	3.84	539.81	-	82.36	-	24.14	213.37	191.89
SEPT	4,440.90	2793.32	-	162.74	609.26	-	409.72	-	226.83	239.03	-
OCT	4,760.48	2793.32	-	51.24	551.46	798.05	171.08	198.55	20.88	87.00	88.90
NOV	3,958.36	2793.32	-	75.69	550.27	-	318.34	5.96	-	214.78	-
DEC	8,097.58	4557.39	-	216.27	1499.06	728.06	445.13	-	143.13	508.54	-
TOTAL	60,754.91	36605.51	-	1938.82	7805.67	1645.46	3096.17	2928.50	1984.86	4193.43	556.49

PLANT

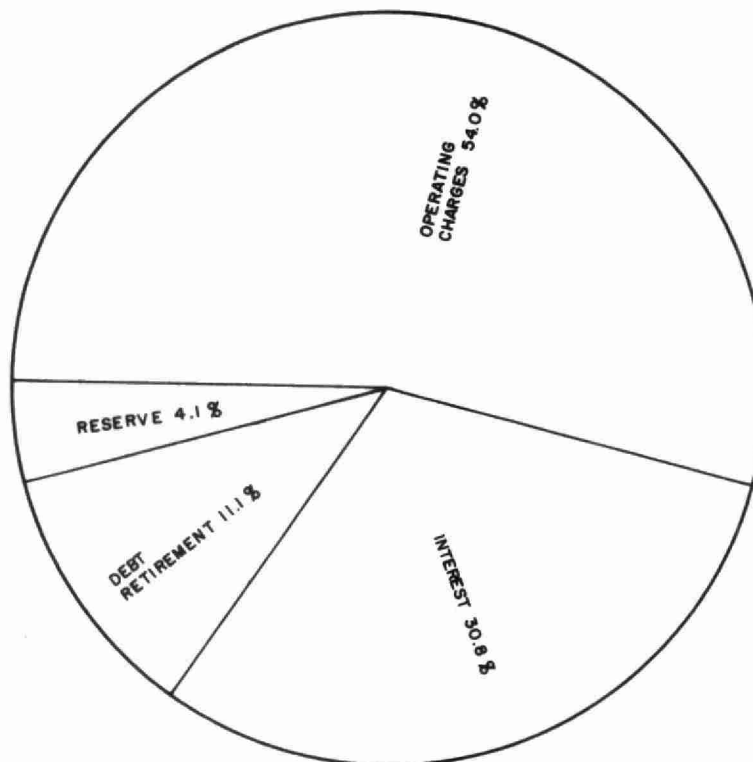
YEARLY

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER CAPITA PER YEAR
1961				
* 1962	297,053	\$56,400.48	\$189.86	\$3.77
+ 1963	336,307	\$60,754.91	\$180.60	4.03
* BASED ON POPULATION OF 14,950 + BASED ON POPULATION OF 15,090				

1963 OPERATING COSTS



TOTAL ANNUAL COSTS



SUMMARY

This report has provided detailed information on the operation of the various treatment units at the Port Colborne Sewage Treatment Plants.

Secondary treatment during the past year was provided for 336 million gallons of sewage which represents a 13.1% increase over the 1962 total flow. All of this increase was realized at the West Side Plant which had an average daily flow for the year of 0.618 MGD.

The effluent being discharged by both plants was satisfactory having average efficiencies of removal of 87.5% and 88.6% for BOD and suspended solids respectively at the West Side Plant and 85.6% and 85.0% at the East Side Plant.

The operating costs for the project have decreased per million gallons of sewage treated from \$189.86 in 1962 to \$180.60 in 1963. At the same time, the operating costs per capita have increased from \$3.77 to \$4.03.

Under the supervision of head office engineers, the plant staff has operated and maintained a clean, attractive and efficient project for the Town of Port Colborne. Head office technical staff assisted in the maintenance of the equipment throughout the year and a well organized preventative maintenance program helped to avert any major breakdowns.



Total 1963 Costs

The total cost to the municipality during 1962 was as follows:

	<u>59-S-47</u>	<u>60-S-73</u>	<u>TOTAL</u>
Operating	\$ 60,754.91	\$ 87.46	\$ 60,842.37
Debt Retirement	12,621.00	9,506.00	22,127.00
Reserve	4,603.00	239.00	6,994.00
Interest	<u>34,851.86</u>	<u>16,164.95</u>	<u>51,016.81</u>
TOTAL	<u>\$ 112,830.77</u>	<u>\$ 28,149.41</u>	<u>\$ 140,980.18</u>

The Reserve Account as of December 3, 1963 was as follows:

59-S-47	\$ 9,663.04
60-S-73	2,440.93



Division of Plant Operations

ONTARIO WATER RESOURCES COMMISSION
801 BAY ST. TORONTO 5